

Plenary Talks

22 May 2023, Monday

Chair: Tao Tang [N003]

09:45-10:30 **Rémi Abgrall** (University of Zürich, Switzerland)
Approximation of nonlinear hyperbolic problems and the property of conservation

Chair: Yanping Lin [N003]

10:50-11:35 **Gang Bao** (Zhejiang University, China)
Some new directions in computational inverse problems

11:35-12:20 **Seung Yeal Ha** (Seoul National University, South Korea)
Emergent dynamics of Kuramoto oscillators

23 May 2023, Tuesday

Chair: Gang Bao [N003]

09:00-09:45 **Wei Cai** (Southern Methodist University, U.S.A.)
Deep neural network algorithms for oscillatory flows, causality operators, and high dimensional Fokker-Planck equations

09:45-10:30 **Congming Li** (Shanghai Jiao Tong University, China)
Liouville type theorems and a priori estimates

Chair: Wei Cai [N003]

10:50-11:35 **Ming-Chih Lai** (National Yang Ming Chiao Tung University, Taiwan)
Solving elliptic interface problems by neural networks

11:35-12:20 **Jianfeng Lu** (Duke University, U.S.A.)
Actor-critic method for solving high dimensional Hamilton-Jacobi-Bellman type PDEs

24 May 2023, Wednesday

Chair: Tong Yang [N003]

09:00-09:45 **Ping Zhang** (Chinese Academy of Sciences, China)
On the one time-varying component regularity criteria for 3-D Navier-Stokes equations

09:45-10:30 **Qiang Du** (Columbia University, U.S.A.)
Nonlocal models with local boundary conditions

Chair: Zhonghua Qiao **[N003]**

10:50-11:35 **Shi Jin** (Shanghai Jiao Tong University, China)
Quantum computation of partial differential equations

11:35-12:20 **Jie Shen** (Purdue University, U.S.A.)
Generalized SAV approach for general dissipative nonlinear systems with particular application to Navier-Stokes equations

25 May 2023, Thursday

Chair: Jie Shen **[N003]**

09:00-09:45 **Jan S. Hesthaven** (École Polytechnique Fédérale de Lausanne, Switzerland)
Structure-preserving model order reduction

09:45-10:30 **Weizhu Bao** (National University of Singapore, Singapore)
Structure-preserving parametric finite element methods (PFEM) for geometric PDEs and applications

Chair: Weizhu Bao **[N003]**

10:50-11:35 **Kun Xu** (The Hong Kong University of Science and Technology, Hong Kong)
Multiscale modeling for non-equilibrium transport

11:35-12:20 **Nicholas Zabaras** (University of Notre Dame, U.S.A.)
Deep learning of multiscale dynamical systems

26 May 2023, Friday

Chair: Shi Jin **[N003]**

09:00-09:45 **Zuowei Shen** (National University of Singapore, Singapore)
Deep approximation via deep learning

09:45-10:30 **Tong Yang** (The Hong Kong Polytechnic University, Hong Kong)
Two problems on the Boltzmann equation with boundary effect

Invited Session 1

22 May 2023, Monday

Chair: Zhu Zhang

[N002]

14:00-14:30 **Zhen Lei** (Fudan University, China)
Energy transfer and generalized Fermi's golden rule in Hamiltonian nonlinear Klein-Gordon equations

14:30-15:00 **Xianpeng Hu** (City University of Hong Kong, Hong Kong)
Incompressible limit of compressible dissipative elastodynamics with vanishing shear viscosity in dimension two

15:00-15:30 **Quoc Hung Nguyen** (Chinese Academy of Sciences, China)
Well-posedness of nonlocal and local quasilinear evolution equations in fluids and geometry

Chair: Ran Zhang

[N002]

15:50-16:20 **Wei Xiang** (City University of Hong Kong, Hong Kong)
Convexity, uniqueness, and stability of the regular shock reflection-diffraction problem

16:20-16:50 **Renjun Duan** (The Chinese University of Hong Kong, Hong Kong)
Spectral gap formation to kinetic equations in soft potentials

23 May 2023, Tuesday

Chair: Xianpeng Hu

[N002]

14:00-14:30 **Zhifei Zhang** (Peking University, China)
Stability threshold of the Couette flow at high Reynolds number

14:30-15:00 **Zhu Zhang** (The Hong Kong Polytechnic University, Hong Kong)
Dispersive limit of kinetic models for collisional plasma

15:00-15:30 **Weixi Li** (Wuhan University, China)
Analytic regularization effect for the non-cutoff Boltzmann equation

Chair: Jianbo Cui

[N002]

15:50-16:20 **Xiaoming He** (Missouri University of Science and Technology, U.S.A.)
New optimized Robin-Robin domain decomposition methods using Krylov solvers for the Stokes-Darcy system

16:20-16:50 **Mingying Zhong** (Guangxi University, China)
Green's function and pointwise behaviors of the 1-D Vlasov-Maxwell-Boltzmann system

24 May 2023, Wednesday

Chair: Zhifei Zhang [N002]

14:00-14:30 **Dehua Wang** (University of Pittsburgh, U.S.A.)
Euler equations and transonic flows

14:30-15:00 **Hongyu Liu** (City University of Hong Kong, Hong Kong)
Inverse problems for mean field games

15:00-15:30 **Zhian Wang** (The Hong Kong Polytechnic University, Hong Kong)
Global solvability and stability of a three-species food chain model with prey-taxis and alarm-taxis

Chair: Dehua Wang [N002]

15:50-16:20 **Yan Xu** (University of Science and Technology of China, China)
Port-Hamiltonian formulations of the incompressible Euler equations with a free surface

16:20-16:50 **Tao Wang** (Wuhan University, China)
Free boundary problems in compressible ideal MHD

25 May 2023, Thursday

Chair: Zhian Wang [N002]

14:00-14:30 **Yang Xiang** (The Hong Kong University of Science and Technology, Hong Kong)
Deep operator-splitting network for solving PDEs

14:30-15:00 **Zhenli Xu** (Shanghai Jiao Tong University, China)
Structure-preserving particle-in-cell methods for plasma simulations

15:00-15:30 **Bangti Jin** (The Chinese University of Hong Kong, Hong Kong)
Conductivity imaging using deep neural networks

Invited Session 2

22 May 2023, Monday

Chair: Hongyu Liu **[N003]**

14:00-14:30 **Lili Ju** (University of South Carolina, U.S.A.)
Low regularity integrators for semilinear parabolic equations with maximum bound principles

14:30-15:00 **Anotida Madzvamuse** (The University of British Columbia, Canada)
From single to collective cell migration: A robust and efficient adaptive multigrid method for geometric surface PDEs

15:00-15:30 **Leevan Ling** (Hong Kong Baptist University, Hong Kong)
Solving PDEs on rough surfaces

Chair: Zhi Zhou **[N003]**

15:50-16:20 **Shuyu Sun** (King Abdullah University of Science and Technology, Saudi Arabia)
Decoupled, linear, and unconditionally energy-stable SPH methods for single-phase and two-phase flows

16:20-16:50 **Jiang Yang** (Southern University of Science and Technology, China)
Energy dissipation of time-fractional phase-field equations: analysis and numerical methods

23 May 2023, Tuesday

Chair: Tao Zhou **[N003]**

14:00-14:30 **Ran Zhang** (Jilin University, China)
Weak Galerkin finite element scheme and its applications

14:30-15:00 **Xinlong Feng** (Xinjiang University, China)
Difference finite element method for 3D incompressible N-S and MHD equations

15:00-15:30 **Dong Wang** (The Chinese University of Hong Kong, Shenzhen, China)
An efficient unconditionally stable method for computing Dirichlet partitions in arbitrary domains

Chair: Xinlong Feng **[N003]**

15:50-16:20 **Tao Zhou** (Chinese Academy of Sciences, China)
Deep adaptive sampling for numerical PDEs

16:20-16:50 **Qiumei Huang** (Beijing University of Technology, China)
Some high order methods for delay differential equations

24 May 2023, Wednesday

Chair: Lili Ju **[N003]**

14:00-14:30 **Arnulf Jentzen** (The Chinese University of Hong Kong, Shenzhen, China)
Overcoming the curse of dimensionality: from nonlinear Monte Carlo to the training of neural networks

14:30-15:00 **Xiaoying Dai** (Chinese Academy of Sciences, China)
Orthogonality preserving schemes for electronic structure calculations

15:00-15:30 **Cheng Wang** (University of Massachusetts Dartmouth, U.S.A.)
A positivity preserving, energy stable finite difference scheme for the Flory-Huggins-Cahn-Hilliard-Navier-Stokes system

Chair: Xiao Li **[N003]**

15:50-16:20 **Tiezheng Qian** (The Hong Kong University of Science and Technology, Hong Kong)
Diffuse-interface approach to competition between viscous flow and diffusion in pinch-off dynamics

16:20-16:50 **Ruo Li** (Peking University, China)
On OP-Mapped WENO schemes

25 May 2023, Thursday

Chair: Buyang Li **[N003]**

14:00-14:30 **Liwei Xu** (University of Electronic Science and Technology of China, China)
Regularized boundary integral equation methods solving scattering wave problems

14:30-15:00 **Xin Liu** (Chinese Academy of Sciences, China)
Constraint dissolving approaches for a class of Riemannian optimization problems

15:00-15:30 **Guanghai Hu** (University of Macau, Macau)
Efficient numerical methods for density functional theory and a software AFEABIC